GORDON, ROBERT E. 1967. *Aneides aeneus.*
Catalogue of American Amphibians and Reptiles, p. 30.

Aneides aeneus (Cope & Packard)
Green salamander

Plethodon aeneus Cope & Packard, 1881:898. Type-locality, "Near the mouth of ...." Nickajack Cave, Marion County, Tennessee. Holotype, Acad. Nat. Sci. Philadelphia 10461, collected by E. D. Cope. Date of collection not known.
Aneides aeneus: Dunn, 1923:39. Transfer of *P. aeneus* to *Aneides*.
Aneides aeneus (Cope): Myers, 1929:23. Erroneous citation of author; see REMARKS.
Aneides aeneus (Cope & Packard): Myers, 1931:95. See REMARKS.

• CONTENT. This is a monotypic species.

• DEFINITION. Adults are of moderate size with a markedly depressed body form; mean snout-vent length is 53 mm (42–68 mm). Females tend to be larger than males, but no significant difference in total or body length occurs. The venter of the adult is light; the dorsum is black with (in life) yellow to yellowish-green lichenlike patches extending onto the head, tail, and limbs. Old individuals lose the lichenlike patches particularly on the temporal and mid-trunk regions. The temporal region becomes much enlarged by development of the jaw musculature, particularly in males.

The tail length is equal to or usually greater than the body length. The tail is round. Costal grooves number 14 or 15. Limbs are long; adpressed limbs overlap by 1–3 costal folds. Digits are long with tips expanded. Toes are 4–5 with the innermost digits reduced.

The anterior prevomerine teeth (vomerine teeth of others; see Wake, 1963) extend beneath the internal nares to near the median line and are separated from the posterior prevomerine teeth (paraspheroid or paravomerine of other authors) by a distance approximately twice the diameter of the internal nares. The anterior prevomerine teeth are in a single row, broken medially by a diastema into right and left series. The number varies with age and size; the combined (right plus left) number for hatchlings varies from 3 to 6; that for adult males averages 19.6 (range 11–27) and for adult females, 18.1 (range 14–25). The maxillary teeth are conical; shape, length, and number vary with sex: males, recurved, spinelike, 7–17, mean 11; females, shorter, spike-like, 12–21, mean 16.

There is no aquatic larval stage; all development occurs within the egg membranes. The young on hatching are best described as miniature adults.

• DESCRIPTION. The adults and young are described by Bishop (1943), Walker & Goodpaster (1941), and Dunn (1926); the eggs, by Pope (1928), supplemented by Bishop (1943) and Gordon (1952). Wake (1963) describes the osteology.

• ILLUSTRATIONS. See Bishop (1943:figs. 95a and 96) for a drawing of an encapsulated larva and photographs of an adult male. Figure 5 in Gordon (1952) is of an adult female laying eggs. Conant (1958:pl. 31) presents a colored photograph of an adult. Cochran (1961:39) has a large photograph of an adult. Wake (1963) illustrates the skull.

• DISTRIBUTION. The known range includes numerous localities in the Allegheny and Cumberland Mountains from Pennsylvania to Alabama and northeastern Mississippi; populations also exist in the southern Blue Ridge Mountains of North Carolina, South Carolina, and Georgia (see Gordon, 1952, for a list of localities).

At the southern end of the range, populations occur in Tishomingo County, Mississippi (Ferguson, 1961) and Tuscaloosa County, Alabama (the latter locality previously unreported). Both populations occupy refugia with many montane affinities. At the northwestern terminus, populations are known from Adams and Lawrence counties, Ohio (Adler & Dennis, 1960). The extent of northward penetration in the Allegheny Mountains is unknown, but expected to be minor. The northernmost record in the Allegheny system is from Fayette County, Pennsylvania (Richmond, 1952). In the Blue Ridge Mountains, no populations are known north of the vicinity of Bat Cave, Rutherford County, North Carolina.

Weller's (1930; see also King, 1939) record from the eastern slope of Mt. LeConte, Sevier County, Tennessee, has not been verified. The species appears to be absent from apparently suitable habitat throughout the Great Smoky Mountains National Park.

Aneides aeneus occurs up to 4400 feet elevation on the south slope of Cold Mountain, Transylvania County, North Carolina; minimal elevation is 460 feet in Tishomingo County, Mississippi.

The restricted habitat of this species—damp but not wet crevices in shaded rock outcrops and ledges, as well as beneath bark and in cracks of trees in cove hardwood forests—results in extreme localization of populations throughout the range. All deep gorges at the periphery of the range should be investigated.

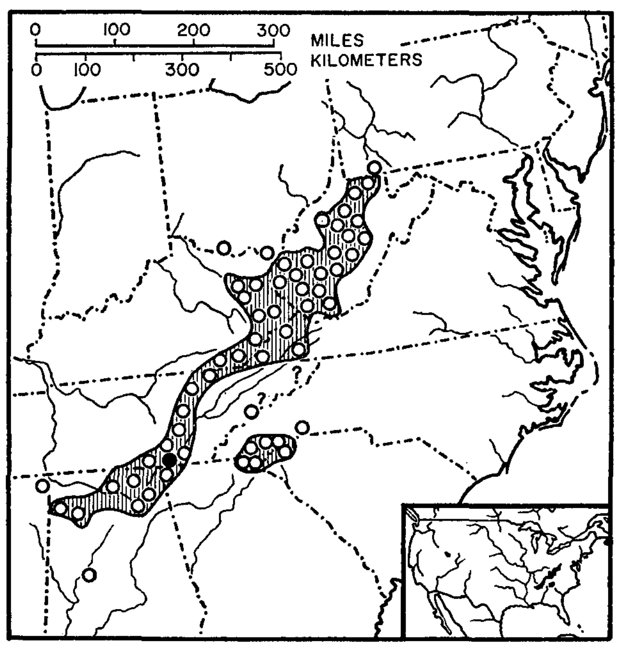
• FOSSIL RECORD. None.

• PERTINENT LITERATURE. The life history and annual cycle are described by Gordon (1952). Pope (1928) provides observations on the species in an arboreal habitat in Kentucky. Schwartz (1954) reports on populations in South Carolina. Lowe (1950) comments on its overall distribution.

• REMARKS. Doubt as to the correct authorship of the name *A. aeneus* was raised by Myers (1929, 1931). The original description in 1881, satisfying the criteria of availibility and proposing the specific epithet *aeneus* was co-authored by E. D. Cope and A. S. Packard. There is ample evidence that Cope collected the material on which the description is based (see p. 878). Further, the last sentence of the paragraph describing *Plethodon aeneus* not only proposes the name but also establishes the author of the name as Cope.

Myers (1929) on the basis of his interpretation of Article 21 of the International Rules felt that the authorship should be attributed to Cope alone. Later Myers (1931) reversed his opinion on the basis that Article 21 (as does Article 50 of the present International Code) requires both name and indication, and definition or description to be attributable to one of the joint authors. Despite the presumed intentions of Cope and Packard, there is no clear-cut evidence that more than selection of the name is attributable to Cope, hence correct usage requires both Cope and Packard as authors with the name *Aneides aeneus*.

• ETYMOLOGY. The specific epithet *aeneus* (Latin *aeneus*, of bronze or copper) has reference to the bronze, lichenlike patches of pigment. Though considerable variation in the intensity of the dorsal patches does exist, yellowish-green is a more appropriate description for most populations.



MAP. The solid dot marks the type-locality; hollow dots show other selected localities. Those outside the shaded areas represent presumably isolated populations. The questioned symbol indicates a doubtful collection site. The other question mark represents a questionable distributional boundary.

Comment

The reproductive behavior preceding egg-laying, although presumably similar to other plethodontids, has not been described.

The prolonged brooding period of the female, varying from 84 to 91 days and utilizing most of the active portion of the annual cycle at approximately 3800 feet, may serve to explain the absence of this species from elevations in excess of 4400 feet. Efforts to secure this form from apparently suitable habitat on the tops of such peaks as Brasstown Bald (Union Co., Georgia), Mt. Mitchell (Yancey Co., North Carolina), Shining Rock Mountain (Haywood Co., North Carolina), and Grandfather Mountain (Avery Co., North Carolina) have been unsuccessful.

Geographic variation has not been studied in this species. The average total length of 32 adults from Jackson County, North Carolina, is 111 mm (extremes 91–122), as compared to Bishop's (1943) report of 102 mm (extremes 81–128) for 19 adults from Kentucky and West Virginia.

Intensity of pigmentation appears to vary with altitude; individuals from Tallulah Gorge (Rabun Co., Georgia) and Cumberland Gap (Lee Co., Virginia) are lighter than those from higher altitudes in Macon, Jackson, and Transylvania counties, North Carolina.

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